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Adding these probabilities from  $r=2$  to  $r=n-1$  (as the bag containing but one black ball must be excluded) and reducing, we have, as the final result, probability required  $= [3n^2 - 5n - 2] / [10n(n-1)]$ . This can easily be verified for small values of  $n$ .

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## PROBLEMS FOR SOLUTION.

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### ALGEBRA.

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190. Proposed by H. H. HOLMES, Brunswick, Maine.

Find the general term of the series 2, 3, 7, 46, 2112, etc.

191. Proposed by NELSON L. RORAY, Bridgeton, N. J.

Find a number such that if it be multiplied by 2, 3, 4, 5, and 6, the cyclical order of its digits will not be changed.

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### GEOMETRY.

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215. Proposed by M. J. NEWELL, A. M., Evanston High School, Evanston, Ill.

Construct geometrically a right triangle, given the bisectors of the acute angles.

216. Proposed by JOHN J. QUINN, Warren High School, Warren, Pa.

Find, by plane geometry, the sides of a right triangle if the hypotenuse is 35, and the side of the inscribed square is 12.

217. Proposed by G. W. DRAKE, Fayetteville, Ark.

If one of the principal axes of a cone which stands on a given base be always parallel to a given right line, the locus of the vertex is an equilateral hyperbola or a right line according as the base is a central conic or a parabola. [Exercise 40, page 94, O. Smith's *Solid Geometry*.]

218. Proposed by O. W. ANTHONY, DeWitt Clinton High School, New York City.

From a given triangle cut off an area equivalent to a given square by a line passing through a given point without the triangle.

219. Proposed by L. E. DICKSON, Ph. D., The University of Chicago.

Devise a simple geometric solution of the general quadratic equation.

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### CALCULUS.

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174. Proposed by B. F. FINKEL, 204 St. Marks Square, Philadelphia, Pa.

Integrate  $\int_0^\infty \frac{\sinh px}{\sinh qx} \cos rx \, dx$ , if  $p^2 < q^2$ .